



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/534,229	03/24/2000	Akira Kawakami	P17156-00004	1735

7590

06/18/2002

Arent Fox Kintner Plotkin & Kahn  
1050 Connecticut Avenue N W Suite 600  
Washington, DC 20036-5339

EXAMINER

RAO, MANJUNATH N

ART UNIT      PAPER NUMBER

1652

DATE MAILED: 06/18/2002

19

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/534,229

Applicant(s)

KAWAKAMI ET AL.

Examiner

Manjunath N Rao

Art Unit

1652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 12-23 is/are pending in the application.
- 4a) Of the above claim(s) 19-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-18 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

Art Unit: 1652

### **DETAILED ACTION**

Claims 12-23 are still at issue and are present for examination. Claims 12-18 and 23 are now under consideration. Claims 19-22 remain withdrawn from consideration as being drawn to non-elected invention.

#### ***Election/Restrictions***

Applicant's election of Group I, Claims 12-18 and 23 in Paper No. 12 is acknowledged. However, while applicants have amended claim 19 and requested for rejoining of claims 19 and 20 with group I, it is not clear to the Examiner whether applicants have traversed the rejection. In view of this, for reasons of record, Examiner has considered the election as election with traverse. Applicants request to rejoin claims 19 and 20 with group I is acknowledged. However, amended claim 19 and claim 20 remain withdrawn from consideration as they are patentably distinct from group I for the following reason.

Inventions II (claims 19-20) and I(claims 12-18 and 23) are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the polynucleotide of group I can be made by first isolating the respective protein, sequence the amino acids and deduce the polynucleotide sequence and chemically synthesize the polynucleotide sequence that encodes the polypeptide as opposed to the method of group II.

The requirement is still deemed proper and is therefore made FINAL.

Art Unit: 1652

Claims 19-22 remain withdrawn from further consideration by the examiner, 37

CFR 1.142(b), as being drawn to a non-elected invention.

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority under 35

U.S.C. 119(a)-(d).

### ***Drawings***

The drawings submitted in this application are accepted by the Examiner for examination purposes only.

### ***Claim Objections***

Claim 18 is objected to because of the following informalities: Claim 18 recites the phrase "corresponding to an amino acid sequence" while referring to a polynucleotide sequence. While the Examiner understands that applicants mean that the claimed polynucleotide "encodes" the said amino acid sequence, the use of the above non-standard phrase in the claim is objected to by the Examiner. Amending the claim to recite "nucleotide sequence encoding the amino acid sequence..." would overcome this objection. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1652

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 12 recites the phrase “chitinase activity at low temperatures”. However a perusal of the specification does not provide a definition for “low temperatures”. It is not clear to the Examiner as to what applicants mean by “low temperatures”. Without a specific numerical value or a temperature range assigned for “low temperatures”, the above phrase renders the claim indefinite. It is also noted that applicants have performed the assay for the recombinant enzymes at a temperature of 38° C which is not considered as “low temperature” in the art.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 recites the phrase “barley-derived chitinase”. The metes and bounds of this phrase is not clear to the Examiner. However, as applicants have used the phrase for comparing their sequence Examiner has interpreted the phrase to mean “barley chitinase”.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 15 recites the phrase “rye-derived chitinase”. The metes and bounds of this phrase is not clear to the Examiner. However, as applicants have used the phrase for comparing their sequence Examiner has interpreted the phrase to mean “rye chitinase”.

Art Unit: 1652

Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 17 recites the phrase "spring wheat-derived chitinase". The metes and bounds of this phrase is not clear to the Examiner. However, as applicants have used the phrase for comparing their sequence Examiner has interpreted the phrase to mean "spring wheat chitinase".

Claims 12-18 and claim 23 which depends from claim 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 12-18 recites the phrase "winter wheat-derived". Unlike in other claims listed above wherein applicants use the phrases "rye-derived" or "barley-derived" for the sake of comparison of sequences, applicants have used the phrase "winter wheat-derived" to specifically claim a polypeptide. Hence, the metes and bounds of this phrase in claims 12-18 and 23 is not clear to the Examiner. Literally, while the term "derived" means "to isolate from or obtain from a source", the above term could also mean "to arrive at by reasoning i.e., to deduce or infer" or also mean "to produce or obtain from another substance". Therefore, it is not clear to the Examiner either from the specification or from the claims as to what applicants mean by the above phrase. It is not clear to the Examiner whether the "winter wheat-derived" cDNA encompasses a single specific cDNA as in "isolated from a winter wheat plant" or whether it encompasses recombinants, variants and mutants of any chitinase cDNA of any wheat or non-wheat plants or modified chitinase cDNAs from any other source and labeled as "winter wheat-

Art Unit: 1652

derived". As applicants have not provided a definition for the above phrase, Examiner has interpreted the claims broadly to mean, that a "winter wheat-derived" cDNA encompasses nucleic acid sequences which are recombinants, variants, or mutants of any chitinase cDNA. Examiner has given the same interpretation while considering the claims for all other rejections.

Claims 13, 15, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 13, 15 and 17 are rejected as indefinite because each of the claim recites the phrase "said cDNA comprises XXX nucleotides/XXX amino acids". While it is well understood in the art that cDNAs comprise only nucleotides, they do not comprise amino acids. The claim as written recites the cDNA as comprising nucleotides or amino acids thus rendering the claims indefinite. Amending the claims to recite "said cDNA comprises XXX nucleotides which encode an amino acid sequence comprising..." or the like would overcome this rejection.

Claims 13, 15, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 13, 15, 17 compares a polynucleotide sequence with a polypeptide sequence by reciting the phrase "on amino acid sequence level" which renders the claim unclear. Sequence comparisons are usually made between polynucleotides or between amino acid sequences. If applicants would like to compare the nucleotide sequence based on the

Art Unit: 1652

encoded amino acid sequence, then amending the claim to recite the phrase "encoding an amino acid sequence that is XX% identical" or the like would render the claim clear.

Claims 13, 15, and 17 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 13, 15 and 17 are also rejected as indefinite because these claims refer to a nucleotide sequence/amino acid sequence without reciting the corresponding SEQ ID NO. Without a specific SEQ ID NO, it would be impossible for the Examiner to search the limitations of these claims especially when claiming sequence similarity with another nucleotide sequence/amino acid sequence just by providing the total number of nucleotides. Furthermore, the claims are also indefinite because these claims compare the claimed cDNA sequence with the cDNA for barley, rye and spring-wheat chitinases without providing SEQ ID NO for those respective cDNA sequences. Without providing the specific barley, rye or spring-wheat chitinase cDNAs it is not clear to the Examiner whether applicants compare the sequence with specific barley, rye or spring-wheat chitinase cDNAs or with any barley, rye or spring-wheat chitinase cDNAs. Examiner has broadly interpreted the latter as the intent of the applicants.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.



Claims 12 and 23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for polynucleotides(cDNA) isolated from winter wheat, with SEQ ID NO:6, 7, or 8, encoding a chitinase enzyme with amino acid sequence as depicted in SEQ ID NO:1, 2 or 3 respectively, does not reasonably provide enablement for any polynucleotides (cDNAs), including recombinants, mutants and variants encoding a chitinase enzyme. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Factors to be considered in determining whether undue experimentation is required, are summarized in *In re Wands* (858 F.2d 731, 8 USPQ 2nd 1400 (Fed. Cir. 1988)) as follows: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claim(s).

Claims 12 and 23 are so broad as to encompass any polynucleotide isolated from any variety of winter wheat (wild or domesticated crop) or any source including recombinants, variants and mutants. The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of cDNAs broadly encompassed by the claims. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are

Art Unit: 1652

conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. However, in this case the disclosure is limited to the nucleotide and encoded amino acid sequence of only three winter wheat chitinases.

While DNA isolation techniques, recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims, and in the case of recombinant and mutants, the positions of amino acids within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass all or any cDNA encoding a chitinase of any variety of winter wheat, modifications and fragments thereof because the specification does not establish: (A) a rational and predictable scheme for modifying any winter wheat chitinase residues with an expectation of obtaining the desired biological function; (B) regions of the protein structure which may be modified without effecting activity; (C) the general tolerance of winter wheat chitinases to modification and extent of such tolerance; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any or all the winter wheat derived chitinase cDNAs. The scope

Art Unit: 1652

of the claims must bear a reasonable correlation with the scope of enablement (*In re Fisher*, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of winter wheat chitinase cDNAs having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See *In re Wands* 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claims 12 and 23 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims are directed to a genus of DNA molecules encoding a protein having chitinase activity at low temperatures.

The specification does not contain any disclosure of the structure of all DNA sequences that encode a chitinase enzyme active at low temperatures. The genus of DNAs that comprise these above cDNA molecules is a large variable genus with the potentiality of having many different structures (i.e. nucleotide sequences). Therefore, many structurally unrelated DNAs are encompassed within the scope of these claims, including partial DNA sequences. The specification discloses only three species of the claimed genus which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Therefore, one skilled in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

Art Unit: 1652

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at [www.uspto.gov](http://www.uspto.gov).

Claims 13, 15, 17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for polynucleotides (cDNA) isolated from winter wheat with SEQ ID NO:6, 7, or 8 encoding a chitinase enzyme with amino acid sequence as depicted in SEQ ID NO:1, 2 or 3 respectively, does not reasonably provide enablement for any other winter wheat derived polynucleotides (cDNAs) including recombinants, variants or mutants encoding a chitinase, that is either 771 nucleotides in length and has a 98% sequence identity with a barley-derived chitinase cDNA or a 972 nucleotides long cDNA that has a 68% sequence identity to rye-derived chitinase cDNA or a 960 nucleotides long cDNA that has 95% sequence identity to spring wheat-derived chitinase cDNA. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Factors to be considered in determining whether undue experimentation is required, are summarized in *In re Wands* (858 F.2d 731, 8 USPQ 2d 1400 (Fed. Cir. 1988)) as follows: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claim(s).

Claims 13, 15, 17 are so broad as to encompass any polynucleotide derived from any source(wild or domesticated crop) including variants and mutants. The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of cDNAs broadly encompassed by the claims. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. However, in this case the disclosure is limited to the nucleotide and encoded amino acid sequence of only three winter wheat chitinases. Furthermore, while there are a number of barley-derived, rye-derived and spring wheat-derived chitinases and their cDNA known in the art, lack of guidance as to which specific barley, rye or spring wheat cDNA is to be considered for sequence comparison amounts to a lack of enablement. A perusal of the specification indicates that the specification is devoid of any barley, rye or spring wheat-derived cDNA sequences or even a guidance as to where to obtain the specific sequences (in terms of accession numbers of GenBank databases) for comparison.

While DNA isolation techniques, recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims, and in the case of recombinant and mutants, the positions of amino acids within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any

Art Unit: 1652

protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass all or any cDNA of specific lengths indicated above and encoding a chitinase of any variety, modifications and fragments thereof because the specification does not establish: (A) a rational and predictable scheme for modifying any chitinase amino acid residues with an expectation of obtaining the desired biological function; (B) regions of the protein structure which may be modified without effecting activity; (C) the general tolerance of chitinases to modification and extent of such tolerance; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any or all the winter wheat derived chitinase cDNAs. The scope of the claims must bear a reasonable correlation with the scope of enablement (*In re Fisher*, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of chitinase cDNAs having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See *In re Wands* 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claims 13, 15 and 17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably

Art Unit: 1652

convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims are directed to a genus of DNA molecules having the limitations of comprising 771 nucleotides, 972 nucleotides or 960 nucleotides and encoding a chitinase enzyme that is 98% identity with barley-derived chitinase (at the amino acid level), or encoding a chitinase enzyme that is 68% identity with rye-derived chitinase (at the amino acid level) or encoding a chitinase enzyme that is 95% identity with spring wheat-derived chitinase (at the amino acid level) having the SEQ ID NO:2 or any DNA which is 95% identical to SEQ ID NO:1 or encodes a protein that is 95% identical to SEQ ID NO:2.

The specification does not contain any disclosure of the structure of all DNA sequences that comprise 771 nucleotides, 972 nucleotides or 960 nucleotides and encoding a chitinase enzyme or the structures of barley or rye or spring-wheat derived chitinase cDNAs. While applicants describe the length of the DNA molecules as 771 nucleotides, 972 nucleotides or 960 nucleotides they do not provide the actual sequence of the polynucleotides. The genus of DNAs that comprise these above cDNA molecules is a large variable genus with the potentiality of having many different structures. Therefore, many structurally unrelated DNAs are encompassed within the scope of these claims, including partial DNA sequences. The specification discloses only three species of the claimed genus (each corresponding to the specific lengths of the DNAs mentioned above) which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Therefore, one skilled in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at [www.uspto.gov](http://www.uspto.gov).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Bryngelsson et al. (GenBank Accession X78671, 11-1-1994 and S48847, 12-10-1994). This rejection is based upon the public availability of the DNA and amino acid sequence information. Claims 12 and 13 of the instant application are drawn to a chitinase cDNA comprising 771 nucleotides and encodes an amino acid sequence that has 98% sequence identity (at the encoded amino acid level) with a barley chitinase cDNA. Bryngelsson et al. disclose a barley chitinase cDNA which is 100% identical to itself and comprises 771 nucleotides, encodes a barley chitinase whose amino acid sequence is 98% (at the encoded amino acid level) identical to the 256 amino acid chitinase encoded by the cDNA of claims 12 or 13. Thus Bryngelsson et al. anticipate claims 12-13 of this application.

In response to the above rejection, applicants may argue that the reference provided by the Examiner does not disclose a “winter wheat-derived” chitinase cDNA encoding a chitinase active at “low temperature”. However, such argument would not be persuasive because of the broad claim interpretation by the Examiner especially for the phrase “winter wheat-derived”. In that regard Examiner would direct the applicant’s attention to the rejection under 35 USC 112, 2<sup>nd</sup> ¶ above, for the phrase “winter wheat-derived”. Furthermore, as applicants have not



Art Unit: 1652

provided a specific definition for “low temperature” but provide an example of the enzyme assay conducted at 38 ° C which is not generally considered as “low temperature” in the art, Examiner has not attached any patentable weight to the phrase “low temperature” as well. Therefore, the reference of Bryngelsson et al. anticipates claims 12 and 13 as written even though the reference does not actually disclose a winter wheat chitinase cDNA wherein the encoded chitinase is active at “low temperature”.

Claims 12 and 15 are rejected under 35 U.S.C. 102(a) as being anticipated by Griffith et al. (WO 99/06565-A2, 2-11-199). This rejection is based upon the public availability of the DNA and amino acid sequence information. Claims 12 and 15 of the instant application are drawn to a chitinase cDNA comprising 972 nucleotides and encoding an amino acid sequence that has 68% sequence identity (at the encoded amino acid level) with a rye chitinase cDNA. Griffith et al. disclose a rye chitinase cDNA which is 100% identical to itself and comprises 972 nucleotides, encodes a rye chitinase whose amino acid sequence is more than 68% (72%) (at the encoded amino acid level) identical to the 323 amino acid chitinase encoded by the cDNA of claims 12, 15. Thus Griffith et al. anticipate claims 12 and 15 of this application.

In response to the above rejection, applicants may argue that the reference provided by the Examiner does not disclose a “winter wheat-derived” chitinase cDNA encoding a chitinase active at “low temperature”. However, such argument would not be persuasive because of the broad claim interpretation by the Examiner especially for the phrase “winter wheat-derived”. In that regard Examiner would direct the applicant’s attention to the rejection under 35 USC 112, 2<sup>nd</sup> ¶ above, for the phrase “winter wheat-derived”. Furthermore, as applicants have not

Art Unit: 1652

provided a specific definition for “low temperature” and provide an example of the enzyme assay conducted at 38 ° C which is not generally considered as “low temperature” in the art, Examiner has not attached any patentable weight to the phrase “low temperature” as well. Therefore, the reference of Griffith et al. anticipates claims 12 and 15 as written even though the reference does not actually disclose a winter wheat chitinase cDNA wherein the encoded chitinase is active at “low temperature”.

Claims 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Liao et al. (GenBank Accession, S38670, 2-20-1995, or X76041, 8-2-1996). This rejection is based upon the public availability of the DNA and amino acid sequence information. Claims 12 and 17 of the instant application are drawn to a chitinase cDNA comprising 960 nucleotides and encoding an amino acid sequence that has 95% sequence identity (at the encoded amino acid level) with a spring wheat chitinase cDNA. Liao et al. disclose a spring wheat chitinase cDNA which is 100% identical to itself and comprises 960 nucleotides, encodes a spring wheat chitinase whose amino acid sequence is more than 95% (at the encoded amino acid level) identical to the 319 amino acid chitinase encoded by the cDNA of claims 12, 17. Thus Liao et al. anticipate claims 12 and 17 of this application.

In response to the above rejection, applicants may argue that the reference provided by the Examiner does not disclose a “winter wheat-derived” chitinase cDNA encoding a chitinase active at “low temperature”. However, such argument would not be persuasive because of the broad claim interpretation by the Examiner especially for the phrase “winter wheat-derived”. In that regard Examiner would direct the applicant’s attention to the rejection under 35 USC 112,

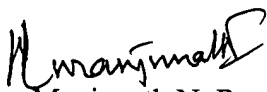
Art Unit: 1652

2<sup>nd</sup> ¶ above, for the phrase “winter wheat-derived”. Furthermore, as applicants have not provided a specific definition for “low temperature” and provide an example of the enzyme assay conducted at 38° C which is not generally considered as “low temperature” in the art, Examiner has not attached any patentable weight to the phrase “low temperature” as well. Therefore, the reference of Liao et al. anticipates claims 12 and 17 as written even though the reference does not actually disclose a winter wheat chitinase cDNA wherein the encoded chitinase is active at “low temperature”.

### ***Conclusion***

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manjunath Rao whose telephone number is (703) 306-5681. The Examiner can normally be reached on M-F from 7:30 a.m. to 4:00 p.m. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, P.Achutamurthy, can be reached on (703) 308-3804. The fax number for Official Papers to Technology Center 1600 is (703) 305-3014. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.



Manjunath N. Rao. Ph.D.  
June 12, 2002